Voluntary - Public

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Post: Beijing

National Food Safety Standard-Sunset Yellow

Report Categories:

FAIRS Subject Report

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Report Highlights:
On May 5, 2010, China notified the WTO of National Food Safety Standard: Food Additives – Sunset Yellow as SPS/N/CHN/274. This measure applies to the production, circulation, supervision and management of the food additive sunset yellow. It specifies the scope, requirements and testing methods. The date for submission of final comments to China is May 20, 2010. The proposed date of entry is May 30, 2010. Contact information on where to send comments is inside the report. This report is an INFORMAL translation of this document.

Executive Summary:
On May 5, 2010, China notified the WTO of National Food Safety Standard: Food Additives – Sunset Yellow as SPS/N/CHN/274. This measure applies to the production, circulation, supervision and management of the food additive sunset yellow. It specifies the scope, requirements and testing methods. The date for submission of final comments to China is May 20, 2010. The proposed date of entry is May 30, 2010. This report is an INFORMAL translation of this document.

Comments can be sent to the China WTO SPS Enquiry Point at: SPS@aqsiq.gov.cn.

This report contains an UNOFFICIAL translation of National Standard on Determination of Sunset Yellow in Foods.

General Information:

BEGIN TRANSLATION

GB National Food Safety Standard
GB 6227.1-XXX

Food Additive - Sunset Yellow

National Food Safety Standard
(Draft for Comment)

Issued on xx-xx-xxxx
Implemented on xx-xx-xxxx
Issued by the Ministry of Health
of the People's Republic of China

Foreword

This Standard is modified in relation to "FD&C yellow No. 6" in the 6th edition of Food Chemicals Codex (FCC 6) of USA.

See Annex E for main technical differences between this Standard and "FD&C yellow No. 6" in the 6th edition of Food Chemicals Codex (FCC 6).

This Standard supersedes GB6227.1-1999 Food Additive - Sunset Yellow.

Main changes between this Standard and GB6227.1-1999 are as follows:

- adding CI No., INS No. and CAS No.;
- modifying requirement for appearance in original standard from orange red powder to orange red powder or granule;
- cancelling content requirement ≥60.0 % in original standard and modifying content requirement from not ≥85.0 % to ≥87.0 %;
- modifying identification method in original standard;
- modifying permissible difference for parallel determinations by spectrophotometric colorimetric method from 2.0 % to 1.0 %;
- modifying requirement for loss on drying, chloride and sulfate from ≤15.0 % to ≤13.0 % and modifying test method;
- adding control requirement and test method of sulfonated intermediates and 1-phenylazo-2-naphthol;
- adding control requirement and test method of unsulfonated aromatic primary amine (based on aniline);
- modifying arsenic test method from chemical half-limit method to atomic absorption method;
- modifying requirement of heavy metal (based on lead) to control requirement of lead, and modifying test method to atomic absorption method; and
- adding control requirement and test method of mercury.

Annex A, Annex B, Annex C and Annex D of this Standard are normative, and Annex E is informative.

This Standard supersedes the following previous editions:

- GB6227.1-1986 and GB6227.1-1999.

National Food Safety Standard

Food Additive - Sunset Yellow

1 Scope

This Standard is applicable to quality control of food additive sunset yellow products prepared by coupling diazotized sulfanilic acid with Schaffer's salt.

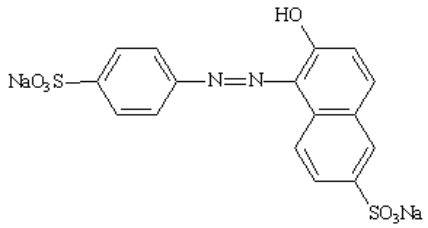
2 Normative references

Documents referenced in this Standard are indispensable for the application of this Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

3 Chemical name, structural formula, molecular formula, relative molecular mass, CI No., INS No. and CAS No.

Chemical name: disodium 6-hydroxy-5-[(4-sulfophenyl)azo]-2-naphthalenesulfononate

Estructural formula:



Molecular formula: C16H10N2Na2O7S2

INS No.: 110

CAS No.: 2783-94-0

Relative molecular mass: 452.37 (according to 2007 International Relative Atomic Mass)

CI No.: C.I. 15985

4 Technical requirements

Technical requirements of sunset yellow shall conform to requirements of Table 1.

Table 1 Technical requirements of sunset yellow

Items	Requirement	Test method
Appearance	Orange red powder or granule	Visual inspection under natural light
Sunset yellow, *w*/%	≥87.0	A.3 in Annex A
Loss on drying, chloride and sulfate (based on sodium salt), *w*/%	≤13.0	A.4 in Annex A
Water insoluble matters, *w*/%	≤0.20	A.5 in Annex A
Sodium sulfanilate, *w*/%	≤0.20	A.6 in Annex A
2-naphthol-6-sodium sulfonate, *w*/%	≤0.30	A.7 in Annex A
6,6′-oxobis(2-naphthalenesulfonate)disodium, *w*/%	≤1.0	A.8 in Annex A
Disodium 4,4′ (diazoamino)dibenzenesulphonate, *w*/%	≤0.10	A.9 in Annex A
1-phenylazo-2-naphthol, *w*/%	≤10.0	A.10 in Annex A
Unsulfonated aromatic primary amine (based on aniline), *w*/%	≤0.01	A.11 in Annex A
Subsidiary colors, *w*/%	≤4.0	A.12 in Annex A
Arsenic / (mg/kg)	≤1.0	A.13 in Annex A
Lead / (mg/kg)	≤0.0	A.14 in Annex A
Mercury / (mg/kg)	≤1.0	A.15 in Annex A

Annex A

(Normative)

Test Method

A.1 General requirements

Reagents and water used in this Standard, unless otherwise stated, are analytically pure reagents and grade III water specified in GB 6682-2008. Standard solution, impurity standard solution, preparations and products required in the tests of this Standard, unless otherwise stated, shall be prepared and calibrated according to requirements of GB/T 601, GB/T 602 and GB/T 603. Test results shall be judged in accordance with 4.3.3 Round-off comparison method in GB/T 8170-2008.

A.2 Identification

A.2.1 Reagents and solutions

a) Sulfuric acid;

b) Ammonium acetate solution: 1.5 g/L.

A.2.2 Apparatus

a) Spectrophotometer;

b) Cuvette: 10 mm.

A.2.3 Identification method

Weigh about 0.1 g (accurate to 0.01 g) of sample, and dissolve in 100 mL of water to obtain clear orange solution.

Weigh about 0.1 g (accurate to 0.01 g) of sample, add 10 mL of sulfuric acid to obtain orange red solution, pipette 2 - 3 drops of this solution and add to 5 mL of water to obtain orange yellow solution.

Weigh about 0.1 g (accurate to 0.01 g) of sample, dissolve in 100 mL of ammonium acetate solution, pipette 1 mL of this solution, and add ammonium acetate solution to make 100 mL of solution which has the maximum absorption wavelength of 482 nm ± 2 nm.

A.3 Determination of sunset yellow

A.3.1 Titanium trichloride titration method (arbitrary method)

A.3.1.1 Method summary

Azo in sunset yellow is reduced and decomposed by titanium trichloride in the presence of acid medium, and then content of subset yellow is calculated based on consumption of titanium trichloride standard titration solution.

A.3.1.2 Reagents and materials

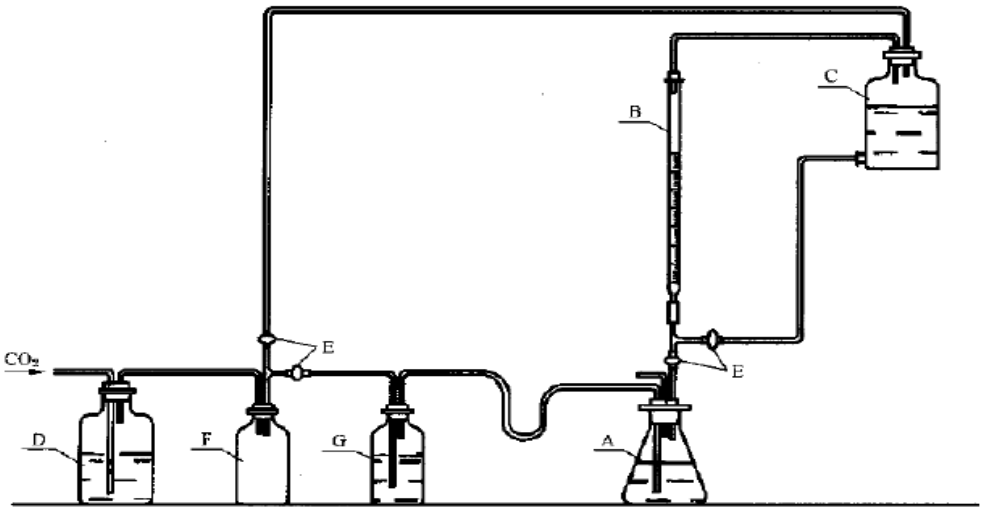
a) Sodium bitartrate;

b) Titanium trichloride standard titration solution: c(TiCl3)=0.1 mol/L (prepared freshly, see Annex B for preparation method);

c) Carbon dioxide contained in steel cylinder.

A.3.1.3 Apparatus

Fig. A.1 Apparatus for titanium trichloride titration method



A - conical flask (500 mL);

B - brown buret (50 mL);

C - glass bottle wrapped by black paper and with bottom mouth (2000 mL);

D - container containing balanced mixture of 100 g/L ammonium carbonate solution and 100 g/L ferrous sulfate solution (5000mL);

E - piston;

F - empty bottle;

G - gas washing bottle, filled with water.

A.3.1.4 Determination procedures

Weigh about 0.5 g (accurate to 0.0001 g) of sample, place in 500 mL conical flask, dissolve in 50 mL of water which is freshly boiled and cooled to room temperature, add 15 g of sodium bitartrate and 150 mL of freshly boiled water, shake to dissolve, install apparatus as Fig.1, introduce carbon dioxide below the liquid level, and heat to boil, and titrate with titanium trichloride standard titration solution until inherent color fades away.

A.3.1.5 Result calculation

Sunset yellow content is calculated according to formula (A.1) based on mass fraction w1, and its value is expressed in %:

$$w_1 = \frac{c(V/1000)(M/4)}{m_1} \times 100 \quad \text{.....(A.1)}$$

where:

c--accurate value of concentration of titanium trichloride standard titration solution, expressed in mol/L;

V--accurate value of volume of titanium trichloride standard titration solution consumed for titrating sample, expressed in mL;

M--value of molar mass of sunset yellow, expressed in g/mol [M(C16H10N2Na2O7S2)=452.37];

m1--value of mass of sample, expressed in g.

The result is rounded to 0.1.

A.3.1.6 Permissible difference

Absolute difference between two parallel determination results is not greater than 1.0 % (mass fraction), and its arithmetic mean is taken as determination result.

A.3.2 Spectrophotometric colorimetric method

A.3.2.1 Method summary

Dissolve sample and subset yellow standard substance with known content in water, respectively determine their absorbance values at the maximum absorption wavelength and then calculate their contents.

A.3.2.2 Reagents and solutions

a) Ammonium acetate solution: 1.5 g/L;

b) Sunset yellow standard substance: ≥87.0 % (mass fraction, follow A.3.1 of this Standard to determine content).

A.3.2.3 Apparatus

a) Spectrophotometer;

b) Cuvette: 10 mm.

A.3.2.4 Preparation of sunset yellow standard solution

Weigh 0.25 g (accurate to 0.0001 g) of sunset yellow standard substance, dissolve in a proper amount of water, transfer to 1000 mL volumetric flask, add ammonium acetate solution to dilute to volume, and shake up. Pipette 10 mL of the solution, transfer to 500 mL volumetric flask, add ammonium acetate solution to dilute to volume, and shake up for use.

A.3.2.5 Preparation of sunset yellow sample solution

Weighing and operation methods are the same as those for preparation of standard solution in A.3.2.4 of this Standard.

A.3.2.6 Determination procedures

Place sunset yellow standard solution and sunset yellow sample solution in 10 mm cuvettes respectively, and determine respective absorbance values by spectrophotometer at the maximum absorption wavelength with ammonium acetate solution as reference solution.

A.3.2.7 Result calculation

Sunset yellow content is calculated according to formula (A.2) based on mass fraction w1, and its value is expressed in %:

$$w_1 = \frac{Am_0}{A_0 m} \times w_0 \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (A.2)$$

where:

A--absorbance value of sunset yellow sample solution;

m0--value of mass of sunset yellow standard substance, expressed in g;

A0--absorbance value of sunset yellow standard solution;

m0--value of mass of sample, expressed in g;

w0--value of content of sunset yellow standard substance, expressed in % (mass fraction).

The result is rounded to 0.1.

A.3.2.8 Permissible difference

Absolute difference between two parallel determination results is not greater than 1.0 % (mass fraction), and its arithmetic mean is taken as determination result.

A.4 Determination of total of loss on drying, chloride (based on NaCl) and sulfate (based on Na2S04)

A.4.1 Determination of loss on drying

A.4.1.1 Determination procedures

Weigh 2 g (accurate to 0.001 g) of sample, place in a weighing bottle made to constant weight, and dry in 135 ℃ constant temperature oven to constant weight.

A.4.1.2 Result calculation

Content of loss on drying is calculated according to formula (A.3) based on mass fraction w2, and its value is expressed in %:

$$w_2 = \frac{m_2 - m_3}{m_2} \times 100 \quad \text{.....(A.3)}$$

where:

m2--mass of sample before drying, expressed in g;

m3--mass of sample dried to constant weight, expressed in g.

The result is rounded to 0.1.

A.4.1.3 Permissible difference

Absolute difference between two parallel determination results is not greater than 0.2 % (mass fraction), and its arithmetic mean is taken as determination result.

A.4.2 Determination of chloride (based on NaCl)

A.4.2.1 Reagents and solutions

a) Nitrobenzene;

b) Activated carbon: type 767 injection powder;

c) Nitric acid solution: 1+1;

d) Silver nitrate solution: c(AgNO3)=0.1 mol/L;

e) Ammonium ferric sulfate solution;

Preparation method: weigh about 14 g of ammonium ferric sulfate, dissolve in 100 mL of water, filter, add 10 mL of nitric acid and store in brown bottle;

f) Ammonium thiocyanate standard titration solution: c(NH4CNS)=0.1 mol/L.

A.4.2.2 Preparation of sample solution

Weigh about 2 g (accurate to 0.001 g) of sample, dissolve in 150 mL of water, add about 15 g of activated carbon, gently boil for 2 - 3 min, add 1 mL of nitric acid solution, constantly shake up, and stand for 30 min (while shaking constantly). Filter with dry filter paper. If the filtrate is colored, add another 5 g of activated carbon, stand for 1 h while shaking constantly, and then filter again with dry filter paper (if the filtrate is still colored, replace activated carbon, repeat operation until the filtrate is colorless). Wash activated carbon with 10 mL of water three times, combine filtrate and transfer to 200 mL volumetric flask, add water to volume, and shake up. Use the sample solution for determination of chloride and sulfate content.

A.4.2.3 Determination procedures

Transfer 50 mL of sample solution to 500 mL conical flask, add 2 mL of nitric acid solution, 10 mL of silver nitrate solution (add more when content of chloride is high) and 5 mL of nitrobenzene, vigorously shake until silver chloride condenses, add 1 mL of ammonium ferric sulfate solution, titrate excessive silver nitrate with ammonium thiocyanate standard titration solution to end point, then keep 1 min, and perform a blank test in the same way.

A.4.2.4 Result calculation

Chloride (based on NaCl) content is calculated according to formula (A.4) based on mass fraction w3, and its value is expressed in %:

$$w_3 = \frac{c_1[(V_1 - V_0)/1000]M_1}{m_4(50/200)} \times 100 \quad \text{.....(A.4)}$$

where:

c1--accurate value of concentration of ammonium thiocyanate standard titration solution, expressed in mol/L;

V 1 --accurate value of volume of ammonium thiocyanate standard titration solution consumed for titrating blank solution, expressed in mL;

V0--accurate value of volume of ammonium thiocyanate standard titration solution consumed for titrating sample solution, expressed in mL;

M1--value of molar mass of sodium chloride, expressed in g/mol, [M(NaCl) = 58,4];

m4--value of mass of sample, expressed in g.

Calculation result is rounded to 0.1.

A.4.2.5 Permissible difference

Absolute difference between two parallel determination results is not greater than 0.3 % (mass fraction), and its arithmetic mean is taken as determination result.

A.4.3 Determination of sulfate (based on Na2S04)

A.4.3.1 Reagents and solutions

a) Sodium hydroxide solution: 0.2 g/L;

b) Hydrochloric acid solution: 1+1999;

c) Barium chloride standard titration solution: c(1/2BaCl2)=0.l mol/L (see Annex C for preparation method);

d) Phenolphthalein indicator solution: 10 g/L;

e) Rhodizonic acid disodium salt indicator solution: weigh 0.1 g of rhodizonic acid disodium salt and dissolve in 10 mL of water (prepared freshly).

A.4.3.2 Determination procedures

Pipette 25 mL of sample solution (A.4.2.2 of this Standard), place in 250 mL conical flask, add 1 drop of phenolphthalein indicator solution, add sodium hydroxide solution drop by drop to develop pink, then add hydrochloric acid solution drop by drop until pink fades away, shake up, dissolve it and then titrate with barium chloride standard titration solution while constantly shaking with rhodizonic acid disodium salt indicator solution as external indicator solution until intersection between reaction liquid and indicator solution on the filter paper shows rose red spots and keeps 2 min without fading, the rose red spots are end points.

Meanwhile, perform blank test in the same way.

A.4.3.3 Result calculation

Sulfate (based on Na2SO4) content is calculated according to formula (A.5) based on mass fraction w4, and its value is expressed in %:

$$w_4 = \frac{c_2[(V_2 - V_3)/1000](M_2/2)}{m_4(25/200)} \times 100 \quad \text{.....(A.5)}$$

where:

c2--accurate value of concentration of barium chloride standard titration solution, expressed in mol/L;

V2--accurate value of volume of barium chloride standard titration solution consumed for titrating sample solution, expressed in mL;

V3--accurate value of volume of barium chloride standard titration solution consumed for titrating blank solution, expressed in mL;

M2--value of molar mass of sodium sulfate, expressed in g/mol [M(Na2SO4)=142,04];

m4--value of mass of sample, expressed in g.

Calculation result is rounded to 0.1.

A.4.3.4 Permissible difference

Absolute difference between two parallel determination results is not greater than 0.2 % (mass fraction), and its arithmetic mean is taken as determination result.

A.4.4 Result calculation of total of loss on dying, chloride (based on NaCl) and sulfate (based on Na2SO4)

Total of loss on dying, chloride (based on NaCl) and sulfate (based on Na2SO4) is calculated according to formula (A.6) based on mass fraction w5, and its value is expressed in %:

$$w_5 = w_2 + w_3 + w_4 \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (A.6)$$

where:

w2--content of loss on drying, expressed in % (mass fraction);

w3--content of chloride (based on NaCl), expressed in % (mass fraction);

w4--content of sulfate (based on Na2SO4), expressed in % (mass fraction).

Calculation result is rounded to 0.1.

A.5 Determination of water insoluble matters

A.5.1 Apparatus

a) Sintered glass crucible: G4, aperture: 5 μm - 15 μm

b) Constant temperature oven.

A.5.2 Determination procedures

Weigh about 3 g (accurate to 0.001 g) of sample, place in 500 mL beaker, add 250 mL of 50 - 60 ℃ hot water to dissolve the sample, filter with G4 sintered glass crucible baked to constant weight at 135 ℃, wash the sample with hot water until filtrate is colorless, and dry it in 135 ℃ constant temperature oven to constant weight.

A.5.3 Result calculation

Content of water insoluble matters is calculated according to formula (A.7) based on mass fraction w6, and its value is expressed in %:

$$w_6 = \frac{m_6}{m_5} \times 100 \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots (A.7)$$

where:

m6 - mass of dried water insoluble matters, expressed in g;

m5 - mass of sample, expressed in g.

Calculation result is rounded to 0.01.

A.5.4 Permissible difference

Absolute difference between two parallel determination results is not greater than 0.05 % (mass fraction), and its arithmetic mean is taken as determination result.

A.6 Determination of sodium sulfanilate

A.6.1 Method summary

Follow reverse liquid chromatography, and quantify by external standard method to calculate mass fraction of sodium sulfanilate.

A.6.2 Reagents and solutions

a) Methanol;

b) Sodium sulfanilate;

c) Ammonium acetate solution: 2 g/L.

A.6.3 Apparatus and instruments

a) High performance liquid chromatograph: infusion pump - flow rate ranging from 0.1 mL/min to 5.0 mL/min, within which its flow stability is ±1 %;

Detector - multi-wavelength UV spectrometer or UV spectrometer with the same performance;

b) Chromatographic column: stainless steel column having length of 150 mm and inner diameter of 4.6 mm, stationary phase: C18, grain size: 5 μm;

c) Chromatographic work station or integrator;

d) Ultrasonic generator;

e) Dosing ring: 20 μL;

f) Micro sample injector: 20 - 100 μL.

A.6.4 Chromatographic conditions

a) Detection wavelength: 254 nm;

b) Column temperature: 40 ℃;

c) Mobile phase: A. ammonium acetate solution; B. methanol;

Concentration gradient: linear concentration gradient ranges from A:B (95:5) to A:B (50:50) within 40 min.

d) Flow rate: 1 mL/min ;

e) Sample size: 20 μL.

Optimal chromatographic conditions can be selected based on different apparatus, and mobile phase shall be shaken up and then de-aerated by ultrasonic generator.

A.6.5 Preparation of sample solution

Weigh 0.1 g (accurate to 0.0001 g) of sample, add ammonium acetate solution to dissolve, and dilute to 100 mL as sample solution.

A.6.6 Preparation of standard solution

Weigh 0.01 g (accurate to 0.0001 g) of sodium sulfanilate which has been dried in vacuum drier for 24 h, dissolve it in ammonium acetate solution, and dilute to 100 mL. Pipette 10 mL of the above solution, add ammonium acetate solution to dilute to 100 mL, then respectively pipette 2.5 mL, 2.0 mL and 1.0 mL of this solution, and respectively dilute to 100 mL with ammonium acetate

solution for use as series standard solutions.

A.6.7 Determination procedures

Pipette sample solution and respective series standard solutions respectively with micro sample injector under chromatographic conditions specified in A.6.4 of this Standard, fill dosing ring for chromatographic detection, and perform result processing after the last component is separated. Determine peak area of sodium sulfanilate in series standard solutions, and draw standard curve. Determine peak area of sodium sulfanilate in sample solution, and calculate content of sodium sulfanilate according to the standard curve. (See Annex D for chromatogram)

A.7 Determination of 2-naphthol-6-sodium sulfonate

A.7.1 Method summary

Follow reverse liquid chromatography, and quantify by external standard method to calculate mass fraction of 2-naphthol-6-sodium sulfonate.

A.7.2 Reagents and solutions

a) 2-naphthol-6-sodium sulfonate;

b) Other reagents and solutions are identical to A.6.2 of this Standard.

A.7.3 Apparatus and instruments

The same as A.6.3 of this Standard.

A.7.4 Preparation of sample solution

The same as A.6.5 of this Standard.

A.7.5 Preparation of standard solution

Weigh about 0.01 g (accurate to 0.0001 g) of 2-naphthol-6-sodium sulfonate which has been dried in vacuum drier for 24 h, Dissolve it in ammonium acetate solution, and dilute to 100 mL. Pipette 10 mL of above solution, and add ammonium acetate solution to dilute to 100 mL. Respectively pipette 2.5 mL, 2.0 mL and 1.0 mL of the solution, and accurately dilute with ammonium acetate solution to 100 mL for use as series standard solutions.

A.7.6 Chromatographic conditions

The same as A.6.4 of this Standard.

A.7.7 Determination procedures

Pipette sample solution and respective series standard solutions respectively with micro sample injector under chromatographic conditions specified in A.7.6 of this Standard, fill dosing ring for chromatographic detection, and perform result processing after the last component is separated. Determine peak area of 2-naphthol-6-sodium sulfonate in series standard solutions, and draw standard curve. Determine peak area of 2-naphthol-6-sodium sulfonate in sample solution, and calculate content of 2-naphthol-6-sodium sulfonate according to the standard curve. (See Annex D for chromatogram)

A.8 Determination of 6,6’-oxobis(2-naphthalenesulfonate)disodium

A.8.1 Method summary

Follow reverse liquid chromatography, and quantify by external standard method to calculate mass fraction of 6,6’-oxobis(2-naphthalenesulfonate)disodium.

A.8.2 Reagents and solutions

a) 6,6’-oxobis(2-naphthalenesulfonate)disodium;

b) Other reagents and solutions are identical to A.6.2 of this Standard.

A.8.3 Apparatus and instruments

The same as A.6.3 of this Standard.

A.8.4 Preparation of sample solution

The same as A.6.5 of this Standard.

A.8.5 Preparation of standard solution

Weigh about 0.01 g (accurate to 0.0001 g) of 6,6’-oxobis (2-naphthalenesulfonate) disodium which has been dried in vacuum drier for 24 h, Dissolve it in ammonium acetate solution, and dilute to 100 mL. Pipette 10 mL of above solution, add ammonium acetate solution to dilute to 100 mL, then respectively pipette 10.0 mL, 5.0 mL, 2.0 mL and 1.0 mL of the solution, and dilute with ammonium acetate solution again to 100 mL for use as series standard solutions.

A.8.6 Chromatographic conditions

The same as A.6.4 of this Standard.

A.8.7 Determination procedures

Pipette sample solution and respective series standard solutions respectively with micro sample injector under chromatographic conditions specified in A.8.6 of this Standard, fill dosing ring for chromatographic detection, and perform result processing after the last component is separated. Determine peak area of 6,6’-oxobis (2-naphthalenesulfonate) disodium in series standard solutions, and draw standard curve. Determine peak area of 6,6’-oxobis (2-naphthalenesulfonate) disodium in sample solution, and calculate content of 6,6’-oxobis (2-naphthalenesulfonate) disodium according to the standard curve. (See Annex D for chromatogram)

A.9 Determination of disodium 4,4’-(diazoamino) dibenzenesulphonate

A.9.1 Method summary

Follow reverse liquid chromatography, and quantify by external standard method to calculate mass fraction of disodium 4,4’-(diazoamino)dibenzenesulphonate.

A.9.2 Reagents and solutions

a) disodium 4,4’-(diazoamino)dibenzenesulphonate;

b) Other reagents and solutions are identical to A.6.2 of this Standard.

A.9.3 Apparatus and instruments

The same as A.6.3 of this Standard.

A.9.4 Preparation of sample solution

The same as A.6.5 of this Standard.

A.9.5 Preparation of standard solution

Weigh about 0.01 g (accurate to 0.0001 g) of disodium 4,4’-(diazoamino) dibenzenesulphonate which has been dried in vacuum drier for 24 h, dissolve it in ammonium acetate solution, and dilute to 100 mL. Pipette 10 mL of above solution, add ammonium acetate solution to dilute to 100 mL, then respectively pipette 10.0 mL, 5.0 mL, 2.0 mL and 1.0 mL of the solution, and dilute with ammonium acetate solution again to 100 mL for use as series standard solutions.

A.9.6 Chromatographic conditions

a) Detection wavelength: 358 nm;

b) Other conditions are identical to A.6.4 of this Standard.

A.9.7 Determination procedures

Pipette sample solution and respective series standard solutions respectively with micro sample injector under the chromatographic conditions specified in A.9.6 of this Standard, fill dosing ring for chromatographic detection, and perform result processing after the last component is separated. Determine peak area of disodium 4,4'-(diazoamino) dibenzenesulphonate in series standard solutions, and draw standard curve. Determine peak area of disodium 4,4'-(diazoamino) dibenzenesulphonate in sample solution, and calculate content of disodium 4,4'-(diazoamino) dibenzenesulphonate according to the standard curve. (See Annex D for chromatogram)

A.10 Determination of 1-phenylazo-2-naphthol

A.10.1 Method summary

Follow reverse liquid chromatography, and quantify by external standard method to calculate mass fraction of 1-phenylazo-2-naphthol.

A.10.2 Reagents and solutions

a) 1-phenylazo-2-naphthol;

b) Mixture of methanol and 2 g/L ammonium acetate solution: 1+1;

c) Other reagents and solutions are identical to A.6.2 of this Standard.

A.10.3 Apparatus and instruments

The same as A.6.3 of this Standard.

A.10.4 Preparation of sample solution

The same as A.6.5 of this Standard.

A.10.5 Preparation of standard solution

Weigh about 0.01 g (accurate to 0.0001 g) of 1-phenylazo-2-naphthol which has been dried in vacuum drier for 24 h. Dissolve it in methanol, transfer the solution to 1000 mL volumetric flask, and add mixture of methanol and 2 g/L ammonium acetate solution to volume. Pipette 10 mL of above solution, add mixture of methanol and 2 g/L ammonium acetate solution to 1000 mL, then respectively pipette 2.0 mL, 1.0 mL and 0.5 mL of the solution, and dilute with mixture of methanol and 2 g/L ammonium acetate solution again to 100 mL for use as series standard solutions.

A.10.6 Chromatographic conditions

a) Detection wavelength: 382 nm;

b) Concentration gradient: linear concentration gradient ranges from A:B (80:20) to A:B (10:90) within 50 min.

c) Other conditions are identical to A.6.4 of this Standard.

A.10.7 Determination procedures

Pipette sample solution and respective series standard solutions respectively with micro sample injector under the chromatographic conditions specified in A.10.6 of this Standard, fill dosing ring for chromatographic detection, and perform result processing after the last component is separated. Determine peak area of 1-phenylazo-2-naphthol in series standard solutions, and draw standard curve. Determine peak area of 1-phenylazo-2-naphthol in sample solution, and calculate content of 1-phenylazo-2-naphthol according to the standard curve. (See Annex D for chromatogram.)

A.11 Determination of unsulfonated aromatic primary amine (based on aniline)

A.11.1 Method summary

Diazotize and couple sample and aniline standard solution, and then compare by spectrophotometry.

A.11.2 Reagents and solutions

a) Ethyl acetate;

b) Hydrochloric acid solution: 1+10;

c) Hydrochloric acid solution: 1+3;

d) Potassium bromide solution: 500 g/L;

e) Sodium carbonate solution: 200 g/L;

f) Sodium hydroxide solution: 40 g/L;

g) Sodium hydroxide solution: 4 g/L;

h) R salt solution: 20 g/L;

i) Sodium nitrite solution: 3.52 g/L;

j) Aniline standard solution: 0.1000 g/L;

Preparation: weigh 0.5000 g of freshly distilled aniline by a small beaker, transfer it to 500 mL volumetric flask, wash the beaker with 150 mL of (1+3) hydrochloric acid solution for three times, combine the above hydrochloric acid solution into 500 mL volumetric flask, and dilute to volume with water. Pipette 25 mL of the solution to 250 mL volumetric flask and add water to volume. Concentration of aniline in this solution is 0.1000 g/L.

A.11.3 Apparatus and instruments

a) Visible spectrophotometer;

b) 40 mm cuvette.

A.11.4 Preparation of sample extract solution

Weigh about 2.0 g (accurate to 0.001 g) of sample, place it in 150 mL beaker, add 100 mL of water and 5 mL of 40g/L sodium hydroxide solution, stir in lukewarm bath until the sample is dissolved completely. Transfer this solution to separating funnel and wash beaker with a little water. Extract twice with 50 mL ethyl acetate each time, and combine extracts. Wash ethyl acetate extracts with 10 mL of 4g/L sodium hydroxide solution to remove trace color. Then, reversely extract ethyl acetate solution with 10 mL of (1+3) hydrochloric acid solution each time for three times. Combine the hydrochloric acid extracts, and then dilute with water to 100 mL and shake up. This solution is the sample extract solution.

A.11.5 Preparation of standard control solution

Pipette 2.0 mL of aniline standard solution, place it in 100 mL volumetric flask, dilute with (1+10) hydrochloric acid solution to volume, mix evenly and take this solution as standard control solution.

A.11.6 Preparation of diazo coupling solution

Respectively pipette 10 mL of sample extract solution and 10 mL of standard control solution, respectively transfer the solution to transparent clean test tubes, and immerse test tubes in beaker containing ice water mixture to cool for 10 min. Respectively add 1 mL of potassium bromide solution and 0.5 mL of sodium nitrite solution to test tubes, slightly shake up, then place test tubes in ice water bath to cool for 10 min, and perform diazo reaction. Respectively take another 25 mL volumetric flask, and transfer 1 mL of R salt solution and 10 mL of sodium carbonate solution to 25 mL volumetric flask. Add aniline diazo salt solution in above test tube to the volumetric flask containing R salt solution, slightly shake the volumetric flask while adding, wash test tube with a little water, add water to the volumetric flask together, and then add water to volume. Adequately mix and place in the darkness for 15 min. The two kinds of solution are

sample diazo coupling solution and standard diazo coupling solution, respectively.

A.11.7 Preparation of reference solution

Pipette 10 mL of (1+10) hydrochloric acid solution, 10 mL of sodium carbonate solution and 1 mL of R salt solution, add to 25 mL volumetric flask and add water to volume. This solution is reference solution.

A.11.8 Determination procedures

Respectively place standard diazo coupling solution and sample diazo coupling solution in cuvettes, determine respective absorbance Aa and Ab by spectrophotometer at 510 nm wavelength with the solution in A.11.7 of this Standard as reference solution.

A.11.9 Result determination

Ab≤Aa is the acceptable result.

A.12 Determination of subsidiary colors

A.12.1 Method summary

Separate and elute various components by paper chromatography, and then quantify by spectrophotometry.

A.12.2 Reagents

a) Absolute ethyl alcohol;

b) N-butyl alcohol;

c) Acetone solution: 1+1;

d) Ammonia solution: 4+96;

e) Sodium bicarbonate solution: 4 g/L.

A.12.3 Apparatus and instruments

a) Spectrophotometer;

b) Chromatography filter paper: 1# medium speed, 150 mm×250 mm;

c) Chromatography tank: φ240 mm×300 mm;

d) Micro sample injector: 100 μL;

e) Nessler tube: 50 mL, with ground glass stopper;

f) Sintered glass funnel: G3, aperture: 15 μm - 40 μm;

g) 50 mm cuvette;

h) 10 mm cuvette.

A.12.4 Determination procedures

A.12.4.1 Paper chromatography condition

a) Developing agent: n-butyl alcohol + absolute ethyl alcohol + ammonia solution = 6 + 2 + 3;

b) Temperature: 20 – 25 ℃.

A.12.4.2 Preparation of sample solution

Weigh about 1 g (accurate to 0.001 g) of sample, place it in beaker, add a proper amount of water to dissolve the sample, transfer the solution to 100 mL volumetric flask, dilute to volume and shake up for use. Concentration of this sample solution is 1 %.

A.12.4.3 Preparation of sample eluate

Pipette 100 μL of sample solution by micro sample injector, evenly inject on a baseline 25 mm away from bottom edge of filter paper to form a straight line and make its width not exceed 5 mm and length be 130 mm on the filter paper, and dry it by blower. Place filter paper into chromatography tank containing developing agent prepared in advance to develop, and immerse the bottom edge of filter paper 10 mm below the level of developing agent until the front line of developing agent rises to 150 mm or separation of subsidiary colors is satisfactory. Take chromatography filter paper out and dry it by cold air.

Develop with blank filter paper that must be cut from adjacent portion on the same filter paper used for developing in above procedure under the same condition.

See Fig. A.2 for schematic diagram of paper chromatography of subsidiary colors.

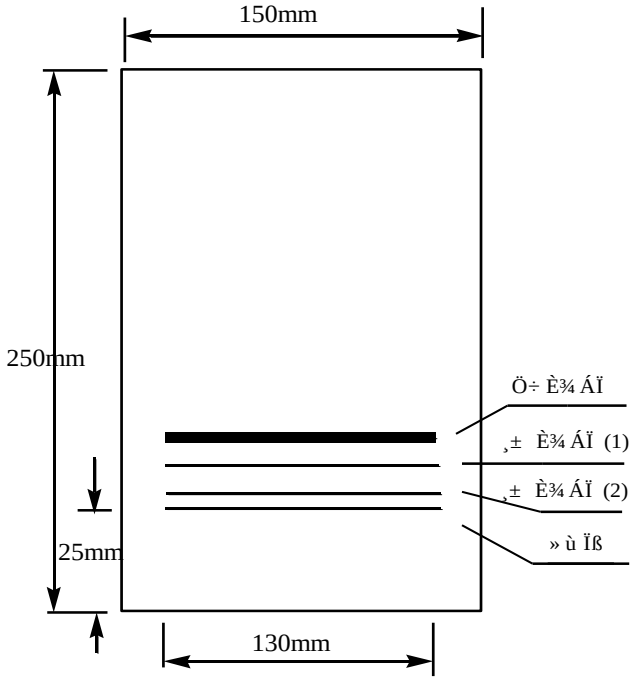


Fig. A.2 Schematic diagram of paper chromatography of subsidiary colors

Cut filter paper with various subsidiary colors obtained after developing and portions of blank filter paper corresponding to various subsidiary colors at the same size, and cut into small strips about 5 mm×15 mm, respectively place them in 50 mL Nessler tubes, accurately add 5 mL of acetone solution, shake for 3 - 5 min, then add accurately 20 mL of sodium bicarbonate solution, shake adequately, and then respectively filter in G3 sintered glass funnel naturally, where filtrate must be clear and have no suspension. Respectively obtain eluates of various subsidiary colors and blank solution. Determine respective absorbance values of eluates of various subsidiary colors through 50 mm cuvette by spectrophotometer at the maximum absorption wavelength of various subsidiary colors.

Take mixture of 5 mL of acetone solution and 20 mL of sodium bicarbonate solution as reference solution while determining absorbance by spectrophotometer.

A.12.4.4 Preparation of standard solution

Pipette 2 mL of sample solution, transfer it to 100 mL of volumetric flask, dilute to volume, and shake up. This solution is the standard solution.

A.12.4.5 Preparation of standard eluate

Pipette 100 μL of standard solution by micro sample injector, evenly inject on a baseline 25 mm away from bottom edge of filter paper, and dry it by blower. Place filter paper into

chromatography tank containing developing agent prepared in advance to develop, take filter paper out after the front line of developing agent rises to 40 mm, dry it by cold air, cut off all portions with developed colors, and perform extraction operation by the method in A.12.4.3 of this Standard to obtain standard eluate. Determine absorbance value by 10 mm cuvette at the maximum absorption wavelength.

Meanwhile, develop with blank filter paper under the same condition and determine absorbance value of eluate after operating by the same method.

A.12.4.6 Result calculation

Content of subsidiary colors is calculated according to formula (A.8) based on mass fraction w7, and its value is expressed in %:

$$w_7 = \frac{[(A_1 - b_1) + \cdots\cdots + (A_n - b_n)]5}{(A_s - b_s)(100/2)} \times S \cdots\cdots\cdots\cdots\cdots\cdots (A.8)$$

where:

A1…An -- absorbance values of eluates of various subsidiary colors determined at 50 mm beam path distance;

b1…bn -- absorbance values of control blank eluates of various subsidiary colors determined at 50 mm beam path distance;

As -- absorbance value of standard eluate determined at 10 mm beam path distance;

bs -- absorbance value of standard control blank eluate determined at 10 mm beam path distance;

5 -- ratio for converting absorbance value to that at 10 mm beam path distance;

100/2 -- ratio for converting absorbance value of standard eluate to that of 1% sample solution;

S -- value of content of sample, expressed in % (mass fraction).

Calculation result is rounded to 0.1.

A.12.4.7 Permissible difference

Absolute difference between two parallel determination results is not greater than 0.2 % (mass fraction), and its arithmetic mean is taken as determination result.

A.13 Determination of arsenic

A.13.1 Method summary

Prepare sunset yellow into sample solution after digestion with wet method, and determine arsenic content by atomic absorption spectrometry.

A.13.2 Reagents and solutions

a) Nitric acid;

b) Sulfuric acid solution: 1+1;

c) Nitric acid-perchloric acid mixture: 3+1;

d) Arsenic (As) standard solution: follow GB/T 602 to prepare and calibrate, then dilute and prepare three standard solutions with corresponding arsenic concentrations according to requirements for apparatus used;

e) Sodium hydroxide solution: 1 g/L;

f) Sodium borohydride solution: 8 g/L(1 g/L sodium hydroxide solution as solvent);

g) Hydrochloric acid solution: 1+10;

h) Potassium iodide solution: 200 g/L.

A.13.3 Apparatus

Atomic absorption spectrometer

Apparatus reference condition: analysis line wavelength of arsenic hollow cathode lamp: 193.7 nm; slit: 0.5 - 1.0nm; lamp current: 6 - 10 mA;

Flow rate of carrier gas: 250 mL/min, argon gas;

Temperature of atomizer: 900 ℃.

A.13.4 Determination procedures

A.13.4.1 Sample digestion

Weigh about 1.0 g (accurate to 0.001 g) of sample, place it in 250 mL conical flask or round bottom flask, add 10 - 15 mL of nitric acid and 2 mL of sulfuric acid, shake up, then heat to expel nitrogen dioxide gas by low fire, stop heating when the solution becomes brown, add 5 mL of nitric acid-perchloric acid mixture after cooling, heat by strong fire until the solution becomes transparent and colorless or yellowish, if the solution is nontransparent, add another 5 mL of nitric acid-perchloric acid mixture after cooling, continue to heat until the solution becomes clear and colorless or yellowish and generates white smoke (avoid carbonization due to burning out), stop heating, add 5 mL of water after cooling, heat to boil to remove residual nitric acid-perchloric acid (if necessary, add water and boil once again), continue heating until the solution generates white smoke, keep 10 min, transfer the solution to 100 mL of volumetric flask after cooling (if the solution is turbid and has precipitate or mechanical impurities, it must be filtered), dilute it with hydrochloric acid solution to volume.

Meanwhile, prepare blank solution by the same method.

A.13.4.2 Determination

Measure 25 mL of digested sample solution, add it to 50 mL volumetric flask, add 5 mL of potassium iodide solution, dilute with hydrochloric acid solution to volume, shake up and stand for 15 min.

Meanwhile, prepare blank test solution with blank solution by the same method.

Turn on the apparatus, take sodium borohydride solution as hydride reducing agent and follow computer instruction to respectively feed standard blank solution, standard solution, sample blank test solution and sample solution in order after apparatus and arsenic hollow cathode lamp are preheated adequately and the baseline is stable. Computer will automatically generate working curve and concentration of arsenic in sample solution with sample blank solution deducted after ending test, and will automatically calculate content of arsenic in sample once sample information (e.g. name, sample weight, dilution volume) is input.

A.13.5 Permissible difference

Absolute difference between two parallel determination results is not greater than 0.1 (mg/kg), and its arithmetic mean is taken as determination result.

A.14 Determination of lead

A.14.1 Method summary

Prepare sunset yellow into sample solution after digestion with wet method, and determine lead content by atomic absorption spectrometry.

A.14.2 Reagents and solutions

a) Lead (Pb) standard solution: follow GB/T 602 to prepare and calibrate, then dilute and prepare three standard solutions with corresponding lead concentrations according to

requirements for apparatuses used;

b) Sodium hydroxide solution: 1 g/L;

c) Sodium borohydride solution: 8 g/L(1 g/L sodium hydroxide solution as solvent);

d) Hydrochloric acid solution: 1+10.

A.14.3 Apparatus

Atomic absorption spectrometer

Apparatus reference condition: Method 3 -- Flame atomic absorption spectrometry in GB 5009.12

A.14.4 Determination procedures

Sample solution and blank solution in A.13.4.1 of this Standard can be adopted directly.

Follow Method 3 -- Flame atomic absorption spectrometry in GB 5009.12.

A.14.5 Permissible difference

Absolute difference between two parallel determination results is not greater than 1.0 (mg/kg), and its arithmetic mean is taken as determination result.

A.15 Determination of mercury

A.15.1 Method summary

Prepare sunset yellow into sample solution after microwave or reflux digestion, and determine mercury content by atomic absorption spectrometry.

A.15.2 Reagents and solutions

a) Mercury standard solution: follow GB/T 602 to prepare and calibrate, then dilute and prepare three standard solutions containing 0.5 μg, 1 μg and 2 μg of mercury in 1 mL;

b) Nitric acid;

c) Hydrogen peroxide;

d) Sodium hydroxide solution: 1 g/L;

e) Sodium borohydride solution: 8 g/L(1 g/L sodium hydroxide solution as solvent);

f) Hydrochloric acid solution: 1+10.

A.15.3 Apparatus

Atomic absorption spectrometer

Apparatus reference condition: analysis line wavelength of arsenic hollow cathode lamp: 253.7 nm; slit: 0.5 nm; lamp current: 6 mA;

Flow rate of carrier gas: 200 mL/min, argon gas;

Temperature of atomizer: normal temperature.

A.15.4 Determination procedures

A.15.4.1 Microwave digestion

Weigh about 0.1 g (accurate to 0.001 g) of sample, place it in digestion tank, add 10 mL of nitric acid and 2 mL of hydrogen peroxide, cover with safety valve, then place digestion tank in microwave oven, heat to 130 ℃ within 10 min, keep 2 min, then heat to 150 ℃ within 5 min, keep 3 min, then heat to 180 ℃ within 5 min and keep 10 min. Transfer sample to 25 mL volumetric flask after the sample is cooled fully (if the solution is turbid and has precipitate or mechanical impurities, it must be filtered), and dilute with hydrochloric acid solution to volume.

A.15.4.2 Reflux digestion

Refer to reflux digestion in Method 2 -- Cold atomic absorption spectroscopy in GB/T 5009.17-2003.

Meanwhile, prepare blank solution by the same method for use as blank reference solution.

A.15.4.3 Determination

Turn on the apparatus, take sodium borohydride solution as hydride reducing agent and follow computer instruction to respectively feed standard blank solution, standard solution, sample blank solution and sample solution in order after apparatus and arsenic hollow cathode lamp are preheated adequately and the baseline is stable. Computer will automatically generate working curve and concentration of mercury in sample solution with sample blank solution deducted after ending test, and will automatically calculate content of mercury in sample once sample information (e.g. name, sample weight, dilution volume) is input.

A.15.4.4 Permissible difference

Absolute difference between two parallel determination results is not greater than 0.1 (mg/kg), and its arithmetic mean is taken as determination result.

Annex B

(Normative)

Preparation Method of Titanium Trichloride Standard Titration Solution

B.1 Reagents and solutions

a) Hydrochloric acid;

b) Ammonium ferrous sulfate;

c) Ammonium thiocyanate solution: 200 g/L;

d) Sulfuric acid solution: 1+1;

e) Titanium trichloride solution;

f) Potassium dichromate standard titration solution: [c(1/6K2Cr2O7)=0.1mol/L], follow GB 602 to prepare and calibrate.

B.2 Apparatus

See Fig. A.1 of Annex A.

B.3 Preparation of titanium trichloride standard titration solution

B.3.1 Preparation

Pipette 100 mL of titanium trichloride solution and 75 mL of hydrochloric acid, place them in 1000 mL brown volumetric flask, dilute to volume with water freshly boiled and cooled to room temperature, shake up, immediately pour the solution down the mouthed flask and preserve under protection of carbon dioxide gas.

B.3.2 Calibration

Weigh about 3 g (accurate to 0.0001 g) of ammonium ferrous sulfate, place it in 500 mL conical flask, and under protection of carbon dioxide gas, add 50 mL of water freshly boiled and cooled to dissolve it, then add 25 mL of sulfuric acid solution, continue introducing carbon dioxide gas for protection below the liquid level, add 35 mL of potassium dichromate standard titration solution quickly and accurately, then titrate with titanium trichloride standard solution to be calibrated to the end point near calculated amount, immediately add 25 mL of ammonium thiocyanate solution, and continue titrating with titanium trichloride standard solution to be calibrated until the solution turns from red to green, i.e. end point. The whole titration process shall be operated under protection of carbon dioxide gas, and a blank test shall be performed at the same time.

B.3.3 Result calculation

Concentration of titanium trichloride standard solution is calculated according to formula (B.1) based on c(TiCl3), and expressed in mol/L:

$$c(TiCl_3) = \frac{cV_1}{V_2 - V_3} \quad \text{.....(B.1)}$$

where:

c -- accurate value of concentration of potassium dichromate standard titration solution, expressed in mol/L;

V1 -- accurate value of volume of potassium dichromate standard titration solution, expressed in mL;

V2 -- accurate value of volume of titanium trichloride standard titration solution consumed for titration and oxidized to high titanium by potassium dichromate standard titration solution, expressed in mL;

V3 -- accurate value of volume of titanium trichloride standard titration solution consumed for titrating blank solution, expressed in mL.

Result calculation is rounded to 0.0001.

Above titration shall be performed instantly while analyzing sample.

Annex C

(Normative)

Preparation Method of Barium Chloride Standard Solution

C.1 Reagents and solutions

a) Barium chloride;

b) Ammonia;

c) Sulfuric acid standard titration solution: [c(1/2H2SO4)=0.1 mol/L], follow GB/T601 to prepare and calibrate;

d) Rhodizonic acid disodium salt indicator solution: (weigh 0.1 g of rhodizonic acid disodium salt, dissolve it in 10 mL of water, and prepare freshly);

e) Universal pH paper.

C.2 Preparation

Weigh 12.25 g of barium chloride, dissolve it in 500 mL of water, transfer the solution to 1000 mL volumetric flask, dilute to volume and shake up.

C.3 Calibration method

Pipette 20 mL of sulfuric acid standard titration solution, place in 250 mL conical flask, add 50 mL of water, neutralize with ammonia until universal pH paper shows 8, then titrate with barium chloride standard titration solution with rhodizonic acid disodium salt indicator solution as external indicator solution until intersection between reaction liquid and indicator solution on the filter paper shows rose red spots and keeps 2 min without fading, that is end point.

C.4 Result calculation

Concentration of barium chloride standard titration solution is calculated according to formula (C.1) based on c(1/2BaCl2), and expressed in mol/L:

$$c(\frac{1}{2}BaCl_2) = \frac{c_1 V_4}{V_5} \text{.....} (C.1)$$

where:

c1 -- accurate value of concentration of sulfuric acid standard titration solution, expressed in mol/L;

V4 -- accurate value of volume of sulfuric acid standard titration solution, expressed in mL;

V5 -- accurate value of volume of barium chloride standard titration solution consumed, expressed in mL.

Calculation result is rounded to 0,0001.

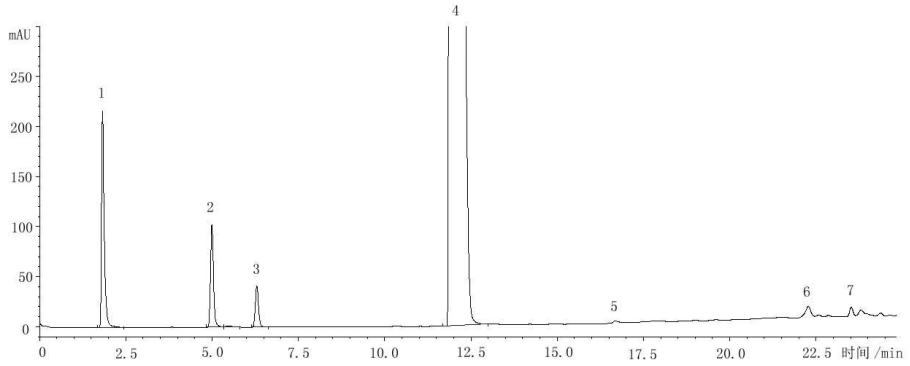
Annex D

(Normative)

Liquid Chromatogram of Sunset Yellow and Retention Time of Components

D.1 Liquid chromatogram of sunset yellow

See Fig. D.1 for liquid chromatogram of sunset yellow.



1. Sodium sulfanilate;
2. disodium 4,4’-(diazoamino)dibenzenesulphonate;
3. 2-naphthol-6-sodium sulfonate;
4. Sunset yellow;
5. 6,6’-oxobis(2-naphthalenesulfonate)disodium;
6. 1-phenylazo-2-naphthol;
7. Unknown matter.

Fig. D.1 Liquid chromatogram of sunset yellow

D.2 Retention time of components of sunset yellow

See Table D.1 for retention time of components of sunset yellow.

Table D.1 Retention time of components of sunset yellow

Peak No.	Component name	Retention time (min)
1	Sodium sulfanilate	1.83

2	disodium 4,4′-(diazoamino)dibenzenesulphonate	4.99
3	2-naphthol-6-sodium sulfonate	6.29
4	Sunset yellow	11.92
5	6,6′-oxobis(2-naphthalenesulfonate)disodium	14.21
6	1-phenylazo-2-naphthol	22.66

Note: Retention time of components of samples may vary in accordance with apparatuses, separating columns, and even in accordance with injection time, but the elution order of various components is the same.

Annex E

(Informative)

Differences Between This Standard and "FD&C Yellow No. 6" in U.S. FCC 6 (2008)

Table E.1 Differences between this standard and "FD&C Yellow No. 6" in U.S. FCC 6 (2008)

Chapter of this Standard Differences between this standard and "FD&C Yellow No. 6" in U.S. FCC 6 (2008)

Chapter of this Standard	Differences between this standard and "FD&C Yellow No. 6" in U.S. FCC 6 (2008)	Cause
A.11	*FCC 6 Sunset Yellow Standard* itemizes unsulfonated aromatic primary amine in six items such as 4-aminoazobenzene, 4-aminobiphenyl, aniline, azobenzene, benzidine and 1,3-diphenyltriazene, requirement is ≤556 μg/kg in total, and unsulfonated aromatic primary amine is determined by liquid chromatography. This Standard combines six items in one item of unsulfonated aromatic primary amine (based on aniline), requirement is controlled to be ≤0.01 %, and test method is spectrophotometry after diazotization and coupling.	In view of actual product production data, sunset yellow product contains these six substances in trace quantity, a majority of six substances can not be detected, and liquid chromatography is complex and has low sensitivity and poor repeatability. In order to control these unsulfonated aromatic primary amines, this Standard combines requirements of six items in one item.
A.12	*FCC 6 Sunset Yellow Standard* itemizes subsidiary colors in two items, specifies that requirement for total of 6-hydroxy-5-(phenylazo)-2-sodium naphthalenesulfonate and 4-[(2-hydroxy-1-naphthyl)azo]sodium naphthalenesulfonate is ≤1 % and that requirement for total of 3-hydroxy-4-[(4-sulfophenyl)azo]-2,7-naphthalene disulfonic trisodium salt and other highly sulfonated subsidiary colors is ≤5 %, which are determined by liquid chromatography. This Standard combines the two items in one item of	Actual detection shows that test of above subsidiary colors by liquid chromatography has poor repeatability and inaccurate detection results. However, spectrophotometry after thin-layer chromatography and elution treatment that has been used in China for many year is mature, has good accuracy and can achieve the purpose of controlling subsidiary colors very well. Thus, this Standard retains chromatography spectrophotometry as test method of

	subsidiary colors and controls requirement to be ≤4.0 %, and test method is spectrophotometry after thin-layer chromatography and elution treatment.	subsidiary colors in original standard.
A.13	Requirement for arsenic (based on As) in *FCC 6 Sunset Yellow Standard* is ≤3 mg/kg, and that in this Standard is ≤1 mg/kg.	In terms of actual production level of sunset yellow, product contains much less than 1 mg/kg of arsenic.

END TRANSLATION